

Patent Claims

1. An installation arrangement for an air-conditioning system with a heating apparatus, in particular for motor vehicles, having
- at least one housing in which air is fed in an at least partially predefined flow path, and
- which has at least one heating apparatus and at least one actuating device, with the heating apparatus being arranged in a first flow path and the actuating device being arranged at least partially in a second flow path,
- characterized in that
- in at least one position the actuating device virtually completely brings about the flow through the heating apparatus.
2. The installation arrangement for an air-conditioning system with a heating apparatus as claimed in claim 1, characterized in that
- the housing has at least one inlet and at least one outlet for the air.
3. The installation arrangement for an air-conditioning system with a heating apparatus as claimed in at least one of the preceding claims, characterized in that
- the heating apparatus is selected from a group of heating apparatuses which contains heat exchangers, CO₂ heat pumps, heaters which use exhaust gas heat, fuel heater, condensers, stationary-mode heaters, electric heaters, PTC heaters and the like.

4. The installation arrangement for an air-conditioning system with a heating apparatus as claimed in at least one of the preceding claims,
5 characterized in that

the heating apparatus has a core which conducts heat and whose heat exchanger surface is formed by baffle plates which are arranged at a predefined
10 angle to the main direction of extent of the core, in a heat-conducting fashion on its surface.

5. The installation arrangement for an air-conditioning system with a heating apparatus as
15 claimed in claim 4, characterized in that

at least part of the surface of the heat-conducting core has a flow of air around it.

20 6. The installation arrangement for an air-conditioning system with a heating apparatus as claimed in claim 5, characterized in that

the cross section of the heat-conducting core is
25 such that the flow of the air at least along part of the surface of the heat-conducting core is essentially laminar.

7. The installation arrangement for an air-conditioning system with a heating apparatus as
30 claimed in one of claims 4 to 6, characterized in that

the cross sectional shape of the heat-conducting
35 core is asymmetrical.

8. The installation arrangement for an air-conditioning system with a heating apparatus as

claimed in one of claims 4 to 7, characterized in that

5 a free cross section through which some of the air which flows through the heating apparatus flows is formed between the heat-conducting core and an element which adjoins the heating apparatus and at least partially bounds the first flow path.

9. The installation arrangement for an air-conditioning system with a heating apparatus as
10 claimed in one of claims 4 to 8, characterized in that

15 a third flow path through which a heating medium flows is arranged within the heat-conducting core.

10. The installation arrangement for an air-conditioning system with a heating apparatus as
20 claimed in claim 9, characterized in that

the heating medium is a fluid, preferably a gas, and is particularly preferably an exhaust gas of a combustion process.

25 11. The installation arrangement for an air-conditioning system with a heating apparatus as claimed in claim 9 or 10, characterized in that

30 the heating medium which flows through the heat-conducting core brings about a temperature gradient across the cross section of the core.

12. The installation arrangement for an air-conditioning system with a heating apparatus as
35 claimed in one of claims 4 to 11, characterized in that

a temperature gradient of the heat-conducting core is at least partially parallel with a temperature

gradient of the air which flows through the heating apparatus.

5 13. The installation arrangement for an air-conditioning system with a heating apparatus as claimed in at least one of the preceding claims, characterized in that

10 the buffer plates of the heat exchanger surface have a basic shape which is selected from a group of shapes which contains squares, rectangles, circles, ellipses, polygons, combinations of the latter and the like.

15 14. The installation arrangement for an air-conditioning system with a heating apparatus as claimed in at least one of the preceding claims, characterized in that

20 the heating apparatus is arranged in a bypass duct.

25 15. The installation arrangement for an air-conditioning system with a heating apparatus as claimed in at least one of the preceding claims, characterized in that

30 the heating apparatus is arranged at a predefined distance from the external wall of the housing.

35 16. The installation arrangement for an air-conditioning system with a heating apparatus as claimed in at least one of the preceding claims, characterized in that

the heat exchanger surface of the heating apparatus assumes a predefined angle to the longitudinal axis of the motor vehicle.

17. The installation arrangement for an air-conditioning system with a heating apparatus as claimed in at least one of the preceding claims, characterized in that
- 5 at least one fan, in particular an electric fan, which promotes the movement of air through the device within at least one flow path is provided in the housing.
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18. The installation arrangement for an air-conditioning system with a heating apparatus as claimed in at least one of the preceding claims, characterized in that
- 15 the air is fed directly and/or indirectly into the passenger compartment of a motor vehicle through the outlet.
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19. The installation arrangement for an air-conditioning system with a heating apparatus as claimed in at least one of the preceding claims, characterized in that
- 25 the actuating device can be moved into at least two positions.
20. The installation arrangement for an air-conditioning system with a heating apparatus as
- 30 claimed in at least one of the preceding claims, characterized in that
- 35 the actuating device is infinitely adjustable, with the proportion of air which is fed through the heating apparatus and/or past the heating apparatus being changed and in particular closed-loop and/or open-loop controlled depending on the position.

21. The installation arrangement for an air-conditioning system with a heating apparatus as claimed in at least one of the preceding claims, characterized in that

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a second actuating device which essentially prevents a flow of air counter to the main direction of flow of the first flow path is arranged downstream of the heating apparatus in the first flow path.

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22. The installation arrangement for an air-conditioning system with a heating apparatus as claimed in claim 21, characterized in that

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the second actuating device is embodied in such a way that it is at least partially opened by the air flowing through the heating apparatus in the main direction of flow.

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23. The installation arrangement for an air-conditioning system with a heating apparatus as claimed in claim 21 or 22, characterized in that

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the second actuating device has a actuating element which at least partially counteracts an opening movement of the actuating device.

24. The installation arrangement for an air-conditioning system with a heating apparatus as claimed in at least one of the preceding claims, characterized in that

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the actuating devices are selected from a group of actuating devices which contains flaps, swinging flaps, segmented flaps, wing flaps, shutters, in particular iris shutters and the like.

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25. The installation arrangement for an air-conditioning system with a heating apparatus as claimed in at least one of the preceding claims, characterized in that

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a device for filtering air, in particular in the region of the inlet is provided.

10 26. The installation arrangement for an air-conditioning system with a heating apparatus as claimed in at least one of the preceding claims, characterized in that

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an closed-loop or open-loop control device which performs closed-loop or open-loop control on, in particular, the quantity of air flowing through is provided on the at least one inlet and/or outlet for the air.

20 27. The installation arrangement for an air-conditioning system with a heating apparatus as claimed in at least one of the preceding claims, characterized in that

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the air is fed at least partially along a dividing wall adjoining an internal combustion engine, and in that at least one heating apparatus is arranged in particular in this region.

30 28. The installation arrangement for an air-conditioning system with a heating apparatus as claimed in at least one of the preceding claims, characterized in that

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the device has at least one sensor which is selected from a group of sensors which determine the temperature, pressure, speed such as, for example, the flow rate of a medium, or the position of a component.

29. The installation arrangement for an air-conditioning system with a heating apparatus as claimed in at least one of the preceding claims, characterized in that
- 5 the individual elements and/or assemblies of the device are arranged basically one behind the other in the flow path, in which case in particular at least one element and/or one assembly can be
- 10 removed from the main flow path of the air by means of a bypass.